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NEW DATA ON THE MILLIPEDE FAUNA (DIPLOPODA) OF ALTAI, RUSSIA

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Altajosoma baltyrgan Mikhaljova, **sp. n.** (Chordeumatida, Diplomaragnidae) is described from the Republic of Altai, Siberia, Russia. New faunistic records are given for three other species of the family Diplomaragnidae as well as species of the families Anthroleucosomatidae, Julidae and Polydesmidae. New data on morphology of *Julus ghilarovi ghilarovi* Gulička, 1963 are presented.

KEY WORDS: Millipedes, fauna, new species, description, new records, Siberia.

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Из Республики Алтай, Россия, описан *Altajosoma baltyrgan* Mikhaljova, **sp. n.** (Chordeumatida, Diplomaragnidae). Приведены новые фаунистические находки трёх других видов семейства Diplomaragnidae, а также видов семейств Anthroleucosomatidae, Julidae и Polydesmidae. Представлены новые сведения по морфологии *Julus ghilarovi ghilarovi* Gulička, 1963.

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INTRODUCTION

The paper continues research on the Altai millipede fauna. This contribution puts on record the material from the poorly explored places of Republic of Altai and the description of a new species from the family Diplomaragnidae. A historical account of research of Altai diplopod fauna can be obtained from the publications by Mikhaljova *et al*. (2008) and Mikhaljova (2009).

MATERIAL AND METHODS

Materials treated here are deposited in Russia in the collections of the Perm State University, Perm, Russia (PSU), the Institute of Biology and Soil Science of the Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, Russia (IBSS) and the Zoological Museum of the State University of Moscow, Moscow, Russia (ZMUM) as indicated in the text.

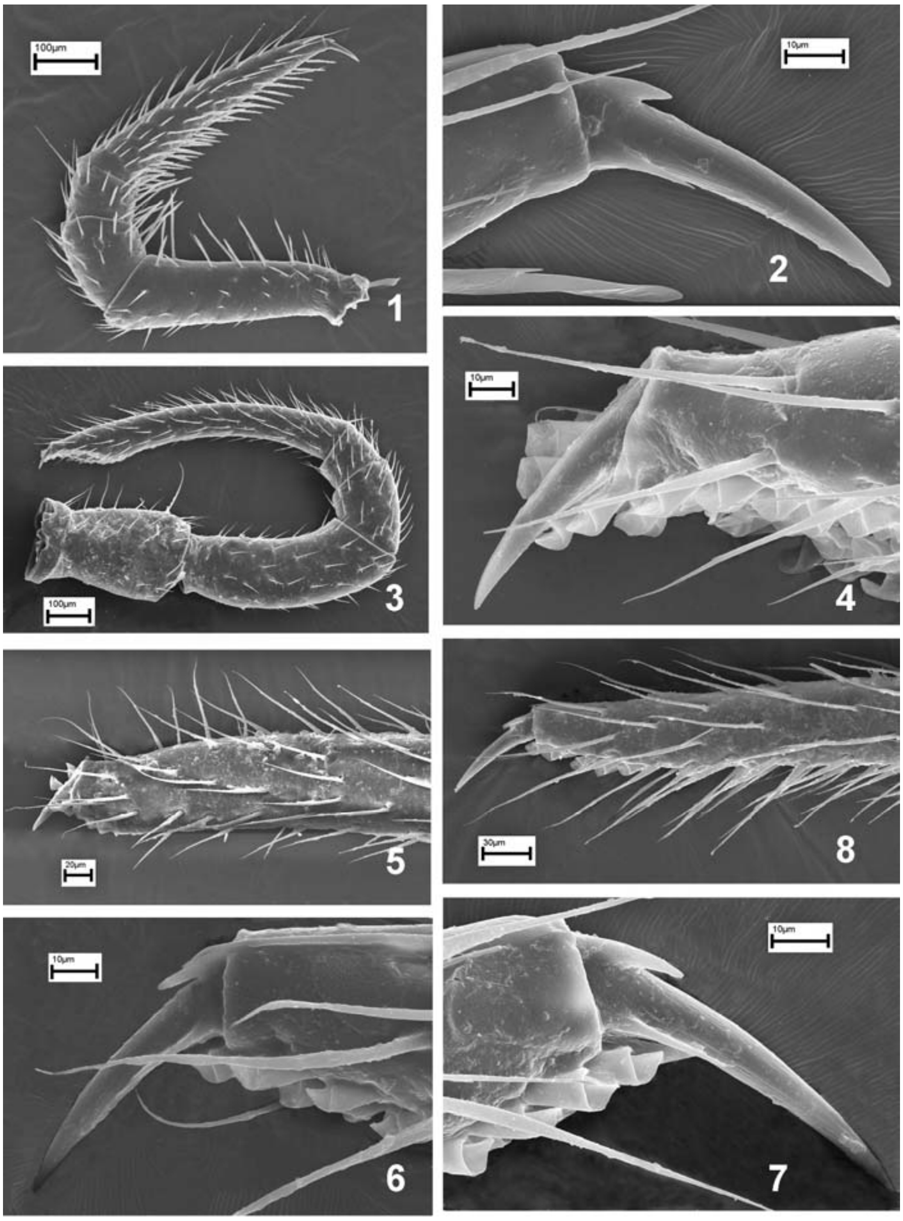
Specimens were kept in 70–75% ethanol. In the process of studying the material, the gonopods and some other parts were dissected from a limited number of males and mounted in glycerin as temporary micropreparations. SEM micrographs were prepared at the Centre of Collective Use "Biotechnology and Gene Engineering" of the Institute of Biology and Soil Science, Far Eastern Branch of the Russian Academy of Sciences in Vladivostok, Russia using a Zeiss Evo 40 scanning electron microscope. Mounts for SEM were made through air-drying after transfer to acetone via 96% alcohol, mounting on stubs, and coating with gold and platinum. After examination, SEM material was removed from stubs and returned to alcohol, all such samples being kept at IBSS.

LIST OF THE SPECIES WITH DESCRIPTIONS OF NEW TAXA

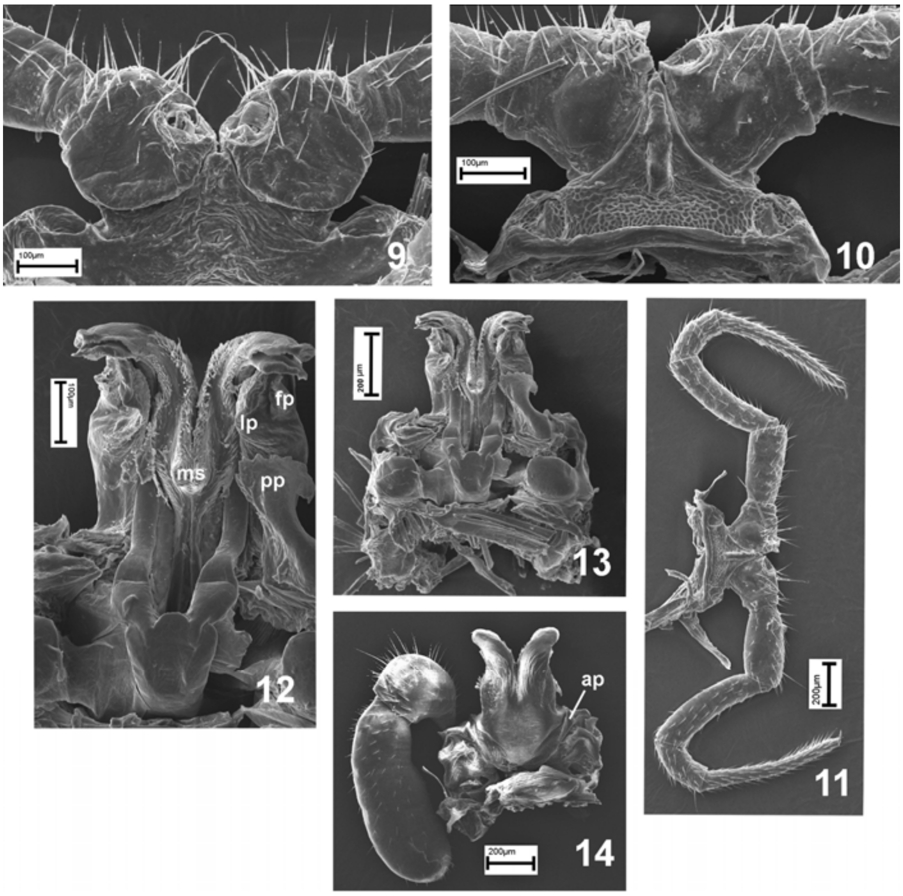
Order Chordeumatida
Family Diplomaragnidae

***Altajosoma baltyrgan* Mikhaljova, sp. n.**
Figs 1–18

MATERIAL. Holotype – ♂ (IBSS), Russia, Republic of Altai, Choiskii District, environs of Baltyrgan Mts, shrub tundra, pitfall traps, 14.VIII 2001, leg. N.V. Levina. Paratypes: Russia, Republic of Altai, Choiskii District, environs of Baltyrgan Mts: 5 ♂, 5 ♀, 4 juveniles (PSU), 14 ♂, 6 ♀ (IBSS), 1 ♂, 1 ♀ (ZMUM), same locality as for holotype, 14.VIII 2001, leg. N.V. Levina; 1 ♀ (PSU), shrub tundra, 6.VIII 2001, leg. N.V. Levina; 2 juveniles (PSU), chern dark coniferous taiga, 9.VIII 2001, leg. N.V. Levina; 1 ♂, 2 ♀ (IBSS), stony tundra, pitfall traps, 12.VIII 2001, leg. N.V. Levina.



Figs 1–8. *Altajosoma baltyrgan* sp. n., male paratype. 1 – leg 2; 2 – claw 2; 3 – leg 3 (coxa omitted); 4 – claw 3; 5 – distal part of leg 7; 6 – claw 10; 7 – claw 11; 8 – distal part of leg of body segment 12; second additional dorsal claw can only be seen ventrally.



Figs 9–14. *Altajosoma baltyrgan* sp. n., male paratype. 9 – coxae 10; 10 – coxae 11; 11 – leg pair 11; 12–13 – gonopods (posterior gonopod telopodites omitted), caudal view; 14 – gonopods, front view; **ms** – mesal sheath processes of posterior gonopod colpocoxites; **lp** – lateral sheath process of posterior gonopod colpocoxite; **fp** – finger-shape outgrowth of colpocoxite lateral sheath process; **pp** – posterior process of posterior gonopod angiocoxite; **ap** – anterior process of posterior gonopod angiocoxite.

DESCRIPTION. MALE. Length 14–15 mm, width, 0.9–1.0 mm without, 1.4–1.5 mm with paraterga. Coloration in alcohol light tan. Legs marble brownish, growing increasingly dark distad. Antennae brown. Eyes black.

Body with 32 segments. Head covered with long and short setae, vertigial suture distinctly visible. Eye patches triangular, each composed of 25–30 ocelli. Antennae long. Collum semi-circular. Body width gradually growing until segment 7, body parallel-sided on segments 8–23(24), onward gradually tapering toward telson. Paraterga beginning from somite 2, well-developed on somites 6–27 (their caudolateral

corners beak-shaped pointed), like low swellings on somite 28, missing on subsequent somites. Macrochaetae thin pointed, lying as a highly extended triangle on somites 28 and 29, arranged typically in a transverse triangle on preceding somites and in a transverse row on somites 30–31. On midbody segments, caudolateral macrochaetae slightly longer than anterolateral ones, medial macrochaetae longest. On front and hind somites, anterolateral, medial and caudolateral macrochaetae subequal in length.

Legs long and slender. Leg pairs 1 and 2 (Fig. 1) typically reduced in size, with tarsal brushes as usual; each claw with setiform filament ventrally at base, and two small additional claws dorsally (Fig. 2; second claw can only be seen ventrally). Leg pairs 3–7 enlarged. Legs of anterior body part (including leg pairs 10 and 11) with a group of funnel-shaped tarsal papillae apically near claw (Fig. 3). Tarsal papillae gradually growing reduced towards posterior body end; at least hindmost legs devoid of any tarsal papillae. Claws of legs 3–7 at base without dorsal additional claws; ventral filament either present or absent (Figs 4–5). Claws of legs 10 (Fig. 6) and 11 (Fig. 7) as well as following midbody legs (Fig. 8) at base with two small additional claws dorsally and a relatively short setoid filament ventrally (second claw can only be seen ventrally). However, claws of hindmost legs at base without dorsal additional claws; ventral filament either present or absent.

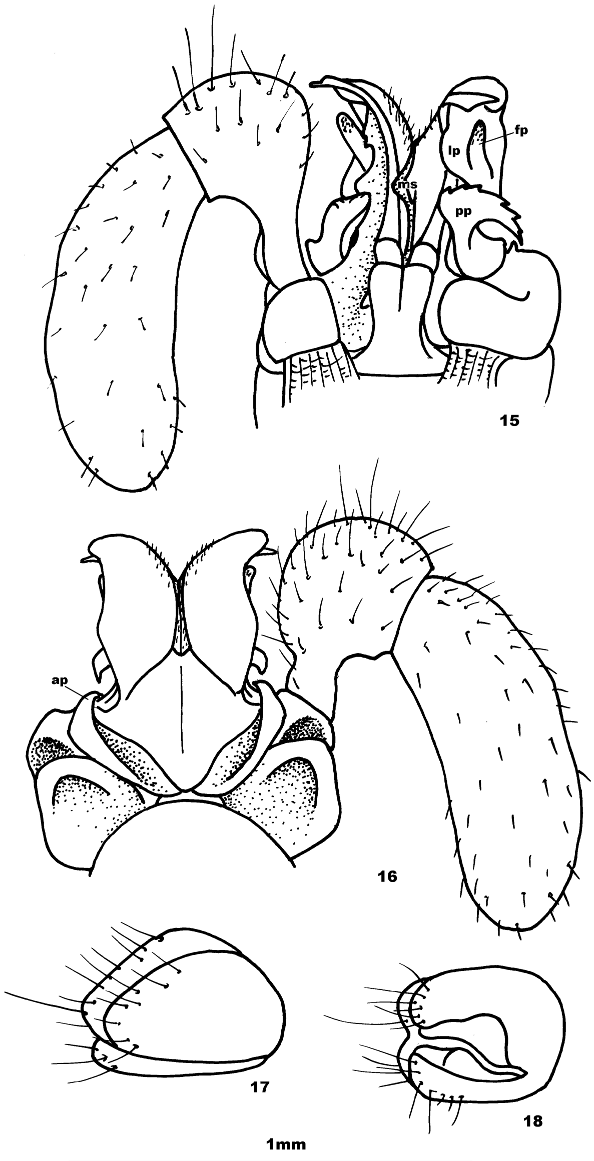
Legs 10 and 11 with coxal glands, in other respects not modified (Figs 9–11).

Anterior gonopod telopodites 2-segmented, subflagelliform (Figs 12–13, 15); first telopodite segment and distal part of coxosternum attached to the adjacent mesal portion of posterior gonopod by thin membranous film. Anterior gonopod telopodite distal part ribbon-shape, visible as stretched beyond sheath groove; apex with lateral extension. Colpocoxites of posterior gonopods fused to 2/3 extent, their distal parts curved caudad. Mesal edge of the sheath groove covered with tiny setae (maybe they are cuticular spinules). Mesal sheath processes of colpocoxite fused medially into single structure (**ms**) whose double nature is distinguished. Lateral sheath process of colpocoxite (**lp**) as large blade with finger-shape ventrally extending outgrowth (**fp**). Posterior gonopod angiocoxite with a globule in posterior view and depressions in anterior view. Posterior angiocoxal process (**pp**) large, curved forward, with apical teeth. Anterior angiocoxal process (**ap**) small and flat, as a crest (Figs 14, 16). Posterior gonopod telopodites 2-segmented, setose, with a long femur.

FEMALE. Length 15–16 mm, width, 1.0–1.1 mm without, 1.7–1.8 mm with paraterga. Ocelli 26–27. Body with 32 segments. Vulvae as in Figs 17–18.

DIAGNOSIS. The new species seems to be particularly closely related to *Altajosoma kemerovo* (Shear 1990) from Russia, Siberia (Kemerovo and Novosibirsk areas, Krasnoyarsk Province, Republic of Khakassia, Republic of Altai), but differs mainly by the configuration of the posterior gonopod colpocoxites, by the presence of the well-defined mesal sheath processes of the posterior gonopod colpocoxites and finger-shape ventrally extending outgrowth of the colpocoxite lateral sheath process.

ETYMOLOGY. The specific epithet refers to the type locality, a noun in apposition.



Figs 15–18. *Altajosoma baltyrgan* sp. n., male paratype (15–16), female paratype (17–18). 15 – gonopods, caudal view (slightly turned to the left); 16 – gonopods, front view; 17 – vulva, lateral view; 18 – vulva, ventral view; **ms** – mesal sheath processes of posterior gonopod colpocoxites; **lp** – lateral sheath process of posterior gonopod colpocoxite; **fp** – finger-shape outgrowth of colpocoxite lateral sheath process; **pp** – posterior process of posterior gonopod angiocoxite; **ap** – anterior process of posterior gonopod angiocoxite. Scale in mm.

***Altajosoma deplanatum* (Stuxberg, 1876)**

MATERIAL. 1 ♂ (PSU), Russia, Republic of Altai, Gorno-Altaisk, Tuu-Gaya Mts, *Pinus* forest, 24.VII 2001, leg. N.V. Levina; Russia, Republic of Altai, Choiskii District, environs of Baltyrgan Mts: 1 ♂, 1 juvenile (PSU), forest-tundra, 1,700 m, 12.VIII 2001, leg. N.V. Levina; 11 ♂ (PSU), 11 ♂ (IBSS), 5 ♀ (PSU), 4 ♀ (IBSS), chern dark coniferous taiga, pitfall traps, 14.VIII 2001, leg. N.V. Levina; 6 ♂ (PSU), 3 ♂ (IBSS), 6 ♀, 1 juvenile (PSU), shrub tundra, pitfall traps, 14.VIII 2001, leg. N.V. Levina.

DISTRIBUTION. Russia: Siberia (Kemerovo Area, between Mariinsk in Kemerovo Area and Achinsk in Krasnoyarsk Province, Republic of Khakassia, Novosibirsk and Tomsk areas, Republic of Altai).

REMARKS. This species was originally described from between Achinsk, Krasnoyarsk Province and Mariinsk, Kemerovo Area, Siberia in a Swedish edition and referred to as *Craspedosoma deplanatum* sp. n. (Stuxberg, 1876a), but then almost immediately redescribed in an English outlet, and again marked as a new species (Stuxberg, 1876b). In both these papers, the descriptions are identical and written in Latin.

Subsequently the species has been redescribed and transferred first to *Diplomaragna* Attems, 1907 (Shear, 1990) and to the resurrected genus *Altajosoma* Gulička, 1972, with *A. pinetorum*, representing its junior subjective synonym (Mikhaljova, 2000).

This species lives in various habitats (forest, forest-tundra, tundra, mesophytous meadow). The maximum altitude registered is 2080 m a.s.l (Mikhaljova *et al*., 2008).

***Altajosoma kemerovo* (Shear, 1990)**

MATERIAL. 1 ♂ (IBSS), Russia, Republic of Altai, Gorno-Altaisk, near water, 27.VII 2001, leg. N.V. Levina.

DISTRIBUTION. Russia: Siberia (Kemerovo and Novosibirsk areas, Krasnoyarsk Province, Republic of Khakassia, Republic of Altai).

REMARKS. Originally described in *Diplomaragna* (Shear, 1990), this species has been transferred to *Altajosoma* (Mikhaljova, 2000).

***Shearia densecava* (Gulička, 1972)**

MATERIAL. Russia, Republic of Altai, Choiskii District, environs of Baltyrgan Mts: 2 ♂, 1 ♀ (IBSS), stony tundra, pitfall traps, 12.VIII 2001, leg. N.V. Levina; 6 ♂, 7 ♀, 1 juvenile (PSU), chern dark coniferous taiga, pitfall traps, 14.VIII 2001, leg. N.V. Levina.

DISTRIBUTION. Russia: Siberia (Republic of Altai).

REMARKS. This species was originally described in *Altajosoma* (Gulička, 1972), later transferred first to *Diplomaragna* (Shear, 1990) and then to *Shearia* Mikhaljova, 2000 (Mikhaljova, 2000).

Family Anthroleucosomatidae

Ghilarovia kygae **Gulička, 1972**

MATERIAL. Russia, Republic of Altai, Gorno-Altaisk: 1 ♀ (PSU), near water, 27.VII 2001, leg. N.V. Levina; 1 ♀ (PSU), stream, pitfal traps, 26.VIII 2001, leg. N.V. Levina; 1 ♂, 1 ♀ (PSU), *Pinus* forest, 27.VIII 2001, leg. N.V. Levina; 2 ♀ (PSU), *Betula* forest, 28.VIII 2001, leg. N.V. Levina; Russia, Republic of Altai, Tuu-Gaya Mts: 1 ♀ (PSU), *Betula* forest, 23.VII 2001, leg. N.V. Levina; 1 ♀ (PSU), *Pinus* forest, 24.VII 2001, leg. N.V. Levina; Russia, Republic of Altai, Choiskii District, environs of Baltyrgan Mts: 4 ♂, 6 ♀, 1 juvenile (PSU), dark coniferous taiga, 3-9.VIII 2001, leg. N.V. Levina; 5 ♂, 3 ♀, 2 juveniles (IBSS), shrub tundra, 6.VIII 2001, leg. N.V. Levina; 1 ♀ (PSU), forest-tundra, 8.VIII 2001, leg. N.V. Levina; 1 ♂ (PSU), forest-tundra, 1700 m,12.VIII 2001, leg. N.V. Levina; 2 ♀ (PSU), stony tundra, 13.VIII 2001, leg. N.V. Levina; 9 ♀ (PSU), chern dark coniferous taiga, 14.VIII 2001, leg. N.V. Levina; 5 ♂, 54 ♀, 2 juveniles (PSU), shrub tundra, pitfall traps, 14.VIII 2001, leg. N.V. Levina.

DISTRIBUTION. Russia: Siberia (Republic of Altai).

Order Julida
Family Julidae

Julus ghilarovi ghilarovi **Gulička, 1963**

MATERIAL. Russia, Republic of Altai, Gorno-Altaisk, Tuu-Gaya Mts: 1 juvenile (PSU), meadow, pitfall traps, 19.VII 2001, leg. N.V. Levina; 1 ♀, 10 juveniles (PSU), *Betula* forest, 23.VII 2001, leg. N.V. Levina; 1 ♀ (PSU), *Pinus* forest, 23.VII 2001, leg. N.V. Levina; 1 ♂, 5 ♀, 1 juvinile (PSU), *Pinus* forest, 24.VII 2001, leg. N.V. Levina; Russia, Republic of Altai, Gorno-Altaisk: 1 juvenile (PSU), garden, 27.VII 2001, leg. N.V. Levina; 3 ♂, 4 ♀, 4 juveniles (PSU), *Pinus* forest, 27.VIII 2001, leg. N.V. Levina; 4 ♂ (IBSS), 5 ♂ (PSU), 1 ♀ (IBSS), 8 ♀ (PSU), 2 juveniles (IBSS), 6 juveniles (PSU), *Betula* forest, 28.VIII 2001, leg. N.V. Levina.

DISTRIBUTION. Russia: Siberia (Kemerovo and Novosibirsk areas, the southern part of Krasnoyarsk Province, Republic of Khakassia, Republic of Altai).

REMARKS. Examination of the above females as well as other females of the species from the collection of IBSS has revealed a small anterior process on each coxa of leg pair 2. This character was not specified in the original description (Gulička, 1963) and redescription (Mikhaljova, 1993). Hence, the character must be included to the original description of the species.

In addition, among the material subadult males have been found. In contrast to adult males, they have under-developed gonopods, normal leg pair 1 and only large coxal process of leg 2 without a posterior uncus.

***Megaphyllum sjaelandicum* (Meinert, 1868)**

MATERIAL. Russia, Republic of Altai: 1 ♂, 5 ♀ (IBSS), Katunskii Reserve, 80 km SSE Ust-Koksa, устье Zaichikha River, 1300 m, 27.VII 2013, leg. M.Yu. Proshchalykin and V.M. Loktionov.

DISTRIBUTION. Central and Eastern Europe, Ural, Russian and Kazakhstan Altai.

Order Polydesmida
Family Polydesmidae

***Schizoturanius clavatipes* (Stuxberg, 1876)**

MATERIAL. Russia, Republic of Altai: 12 juveniles (PSU), Tuu-Gaya Mts, meadow, pitfall traps, 19.VII 2001, leg. N.V. Levina; Russia, Republic of Altai, Choiskii District, environs of Baltyrgan Mts: 1 ♂ (PSU), chern dark coniferous taiga, 3.VIII 2001, leg. N.V. Levina; 2 ♂ (IBSS), chern dark coniferous taiga, 9.VIII 2001, leg. N.V. Levina; 4 ♂, 1 ♀ (PSU), chern dark coniferous taiga, pitfall traps, 14.VIII 2001, leg. N.V. Levina.

DISTRIBUTION. Russia: Siberia (Kemerovo, Novosibirsk and Tomsk areas, Krasnoyarsk Province, Republic of Khakassia, Altai Province, Republic of Altai).

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